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	1	6,174,365	B1	S	anjoh	01-16-200	)1		
	2	6,007,309		Hartley		12-28-199	99		
	3	5,876,187		Afrom	owitz et al.	03-02-199	99		
	4	5,836,750		Cabuz		11-17-199	98		
	5	5,759,014		Van Lintel		06-02-199	98		
	6	5,705,018		Hartley		01-06-199	8		
	7	5,659,171		You	ng et al.	08-19-199	97		]
	8	5,529,465		Zeng	erle et al.	06-25-199	96		<u> </u>
L	9	5,376,252			rom et al.	12-27-199	94		]
oxdot	10	5,375,979			Trah	12-27-199			
	11	5,336,062		R	ichter	08-09-199	94		
	12	5,265,327			ris et al.	11-30-199			
igsquare	13	5,259,737			suki et al.	11-09-199			
	14	5,224,843		<u> </u>	n Lintel	07-06-199			
	15	5,171,132		Miya	zaki et al.	12-15-199	92		]
	16	5,096,388		<del> </del>	einberg	03-17-199			]
	17	5,085,562			n Lintel	02-04-199			]
- and	18	4,153,855		1	eingold	05-08-197			]
LINC	19	4,119,368		Ya	mazaki	10-10-197	78		]
L		1	1	İ					



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FOREIGN PATENT DOCUMENTS							
Examiner	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee	Date of Publication of	Pages, Columns, Lines, Where Relevant
Initials*		Office <sup>3</sup>	Number⁴	Kind Code <sup>5</sup> ( <i>if known</i> )	or Applicant of Cited Document	Cited Document MM-DD-YYYY	Passages or Relevant Figures Appear
DYTH	20	wo	99/17093	A1		04-08-1999	
	21	wo	98/07069	A1		02-19-1998	
$\overline{}$	22	EP	999 055	A2		10-05-2000	
	23	EP	845 603	A1		06-03-1998	
	24	EP	829 360	A2		03-18-1998	
7	25	EP	779 436	A2		06-18-1997	
$\overline{}$	26	EP	706 004	A2		04-10-1996	
	27	EP	703 364	A1		03-27-1996	
7	28	EP	592 094	A2		04-13-1994	
Anna	29	GB	2 308 460	Α		06-25-1997	
MYV	30	GB	2 155 152	Α		09-18-1985	

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## **INFORMATION DISCLOSURE** STATEMENT BY APPLICANT

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Sheet	1	of	3

	Complete if Known	
Application Number	09/826,583	
Filing Date	04/06/01	<b>%</b>
First Named Inventor	Marc A. Unger	O <sub>C</sub>
Group Art Unit	1772	A 9
Examiner Name	Unassigned	
Attorney Docket Number	20174-003010US	*/

		OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS	•
Examiner Initials *	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
	31	Brechtel et al., "Control of the electroosmotic flow by metal-salt-containing buffers," J Chromatography A, 716:97-105 (1995).	
	32	Bryzek et al., "Micromachines on the march," <u>8045 IEEE Spectrum</u> , 31(5):20-31 (1994). XP 000456261	
	33	Buchaillot et al., "Silicon Nitride Thin Films Young's Modulus Determination by an Optical Non-Destructive Method," <u>Jpn. J. Appl. Phys.</u> , 36 Pt. 2(6B):L794-L797 (1997).	
	34	Chiu et al., "Patterned deposition of cells and proteins onto surfaces by using three-dimensional microfluidic systems", PNAS, 97(6):2408-2413 (2000).	
	35	Chou et al., "A microfabricated device for sizing and sorting DNA molecules," <u>PNAS</u> , 96:11-13 (1999).	
	36	Delamarche et al., "Patterned Delivery of Immunoglobulins to Surfaces Using Microfluidic Networks," <u>Science</u> , 276:779-781 (1997).	
	37	Duffy et al., "Rapid Prototyping of Microfluidic Systems in Poly(dimethylsiloxane)", Analytical Chemistry, 70(23):4974-4984 (1998).	
	38	Duffy et al., "Rapid prototyping of microfluidic switches in poly(dimethyl siloxane) and their actuation by electro-osmotic flow," <u>J. Micromech. Microeng.</u> , 9:211-217 (1999).	
	39	Duffy et al., "Patterning Electroluminescence Materials with Feature Sizes as Small as 5µm Using Elastomeric Membranes as Masks for Dry Lift-Off," <u>Advanced Materials</u> , 11(7):546-552 (1999) XP-000849014	
	40	Effenhauser et al., "Integrated capillary electrophoresis on flexible silicone microdevices: Analysis of DNA restriction fragments and detection of single DNA molecules on microchips," Anal. Chem., 69:3451-3457 (1997).	
	41	Effenhauser et al., "Integrated chip-based capillary electrophoresis," <u>Electrophoresis</u> , 18:2203-2213 (1997).	
	42	Fahrenberg et al., "A microvalve system fabricated by thermoplastic molding," <u>J. Micromech. Microeng.</u> , 5:169-171 (1995).	
	43	Fu et al., "A microfabricated fluorescence-activated cell sorter," Nature Biotechnology, 17:1109-1111 (1999).	
	44	Goll et al., "Microvalves with bistable buckled polymer diaphragms," J. Micromech. Microeng., 6:77-79 (1996).	
	45	Graveson et al., "Microfluidics—a review", J. Micromech. Microeng, 3:168-182 (1993).	
	46	Harrison et al., "Micromachining a miniaturized capillary electrophoresis-based chemical analysis system on a chip," <u>Science</u> , 261:895-897 (1993).	
	47	Hornbeck et al., "Bistable Deformable Mirror Device," Spatial Light Modulators and Applications 1988 Technical Digest Series, Volume 8, Postconference Edition, Summaries of papers presented at the Spatial Light Modulators and Applications Topical Meeting, June 15-17, 1988, Optical Society of America, pgs. 107-110.	

		41
48	Hosokawa et al., "Handling of Picoliter liquid samples in a poly(dimethylsiloxane)-based microfluidic device," Anal. Chem., 71(20):4781-4785 (1999).	T
49	Ikuta et al., "Three dimensional micro integrated fluid systems (MIFS) fabricated by stereo lithography," <i>IEEE Kyushu Institute of Technology</i> , pgs. 1-6 (1994).	
50	Jacobson et al., "High-speed separations on a microchip," Anal. Chem., 66(7):1114-1118 (1994).	
51	Jacobson et al., "Microfluidic devices for electrokinetically driven parallel and serial mixing," Anal. Chem., 71(20):4455-4459 (1999).	
52	Jung et al., "Chemical and Physical Interactions at Metal/Self-Assembled Organic Monolayer Interfaces," Crit. Rev. Solid State Material Sciences, 19(1):2-10 (1994) XP000955639	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
53	Kenis et al., "Microfabrication inside capillaries using multiphase laminar flow patterning," Science, 285:83-85 (1999).	1
54	Kopp et al., "Chemical Amplification: Continuous-Flow PCR on a Chip", Science, 280:1046-1048 (1998).	
55	Kuhn et al., "Silicon Charge Electrode Array for Ink Jet Printing", <u>IEEE Transactions</u> on Electron Devices, ED-25(10):1257-1260 (1978).	
56	Lin et al., "Free-space micromachined optical switches for optical networking," <u>IEEE J.</u> <u>Selected Topics in Quantum Electronics</u> , 5(1):4-9 (1999).	
57	Lötters et al., "The mechanical properties of the rubber elastic polymer polydimethylsiloxane for sensor applications," <u>J. Micromech. Microeng.</u> , 7:145-147 (1997).	
58	Lucy et al., "Characterization of the cationic surfactant induced reversal of electroosmotic flow in capillary electrophoresis," Anal. Chem., 68:300-305 (1996).	
59	Maluf, N., An Introduction to Microelectromechanical Systems Engineering, Artech House Publishers, Boston London pages 42-45.	
60	Markx et al. "Applications of dielectrophoresis in biotechnology," <u>Tibtech</u> , 15:426-432 (1997).	
61	Muller et al., "Surface-micromachined microoptical elements and systems,"  Proceedings of IEEE, 86(8):1705-1720 (1998).	
62	Qin et al., "Elastomeric Light Valves" Advanced Materials, 9(5):407-410 (1997) XP-000683891	
63	Qin et al., "Photolithography with transparent reflective photomasks," <u>J. Vac. Science</u> and <u>Technology</u> , 16(1):98-103 (1998) XP00213356	
64	Rapp, R., "LIGA micropump for gases and liquids," Sensors and Actuators A, 40:57-61 (1994).	
65	Roylance et al., "A Batch-Fabricated Silicon Accelerometer", <u>IEEE Transactions on Electron Devices</u> , ED-26(12):1911-1917 (1979).	
66	Schasfoort et al., "Field-effect flow control for microfabricated fluidic networks," Science, 286:942-945 (1999).	
67	Schueller et al., "Fabrication of glassy carbon microstructures by soft lithography,"  Sensors and Actuators A, 72(2):125-139 (1999) XP004155654	
68	Shoji, S., "Fluids for Sensor Systems", <u>Topics in Current Chemistry</u> , 194:162-188 Springer Verlag Berlin Heidelberg (1998).	
69	Smits, J.G., "Piezoelectric Micropump with Three Valves Working Peristaltically", Sensors and Actuators, A21-A23:203-206 (1990).	
70	Tufte et al., "Silicon diffused-element piezoresistive diaphragms," J. Appl. Phys., 33(11):3322-3327 (1962).	
71	Van der Pol et al., "Micro Liquid Handling Devices - A Review", Micro Systems Technologies, 90:799-805 (1990).	
72	Washizu et al., "Molecular dielectrophoresis of biopolymers," <u>IEEE Transactions on Industry Applications</u> , 30(4):835-843 (1994).	

73	Xia et al., "Complex optical surfaces formed by replica molding against elastomeric masters," Science, 273:347-349 (1996).		
74	Xia et al., "Soft Lithography," Angew. Chem. Int. Ed. 37:551-575 (1998).		
75	Xia et al., "Micromodeling of Polymers in Capillaries: Applications in Microfabrication," Chemistry of Materials, 8(7):1558-1567 (1996) XP000626885		
76	Yang et al., "A Mems Thermopneumatic Silicone Membrane Valve", Proceedings of IEEE 10 <sup>th</sup> Annual International Workshop on MicroElectro Mechanical Systems, Sensors and Actuators, A64(1):101-108 (1998).	٠ <u>,</u>	
77	Yazdi et al., "Micromachined inertial sensors," <u>Proceedings of IEEE</u> , 86(8):1640-1659 (1998).	j	
78	Young et al., "Contoured elastic-membrane microvalves for microfluidic network integration," J. Biomechanical Engineering, 121:2-6 (1999).		1
79	XP-002149046, Ullmann's Encyclopedia of Industrial Chemistry, Sixth Edition, 1999 Electronic Release, 6 pages.	7	>
		0	

Examiner	Date	
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